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By

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The importance of the use of fertilizer in a forage crop production program is becoming better appreciated. The present tight feed situation and the increased assistance for conservation work, coupled with the problem of developing a sound basis for a program for utilizing the large amounts of nitrogen that will be available for agricultural use during the post-war period, have stimulated additional interest in this problem. An important preliminary step in the formulation of any program, however, should be the assembly and evaluation of information already available on the subject.

The purpose of this study has been the assembly and analysis of the research data now available on the fertilization of forage crops, especially hay and pasture. The data have been dealt with on a State basis. As was to have been expected, there was considerable lack of uniformity in the manner in which the fertilizer projects were laid out in the various States as well as in the presentation of the data. Notwithstanding this difficulty, an attempt has been made to reduce the data to a comparable basis. For convenience it was decided to determine the yield, expressed in terms of: (1) pounds of dry matter, (2) digestible protein, (3) 4 percent milk, and (4) live weight of beef resulting from the use of: (1) one pound of nitrogen, (2) one pound of phosphoric acid, (3) one pound of potash, or (4) one pound of plant food in a complete fertilizer.

In analyzing the data from a given State or experiment, it was deemed advisable to reduce the results to a weighted average where possible. Weighted averages were estimated separately for each of the three classes of vegetation: (1) grasses, (2) grasses and legumes, and (3) legumes. Within these crop classifications each different combination of fertilizer treatment was averaged separately.

In determining the yield resulting from the use of a pound of plant food in complete fertilizers, results from only those mixtures which contained the three plant food elements were used in this connection.

The procedure followed in this study does not always make proper allowance for the residual effects of fertilizers. Neither was consideration always given to the improved quality of the forage produced as a result of the use of fertilizers.

In determining the yield of dry matter, digestible protein, and total digestible nutrients, the following values taken from Morrison's "Feeds and Feeding" were used:

<u>Crop</u>	<u>Total</u> <u>dry matter</u>	<u>Percent</u> <u>digestible protein</u>	<u>Total</u> <u>digestible nutrients</u>
Alfalfa hay	90.4	12.0	51.1
Grass - clover	89.7	5.2	50.5
Sudan grass	89.2	4.7	51.7
Sorghum	89.2	3.6	52.7
Soybean hay	90.8	11.9	53.0
Cowpeas	89.9	12.3	50.3
Clover - Timothy	91.9	4.8	51.4
Low hop clover	89.0	10.1	53.1
Ladino	88.0	10.5	55.6
Sweet clover	92.0	10.5	49.9
Kentucky bluegrass	89.4	4.7	53.3
Lespedeza	89.0	10.1	53.1
Bermuda grass	90.7	3.7	43.0
Timothy	88.7	4.8	51.8
Austrian peas - vetch	88.5	13.4	56.9
Rhode Island bent grass	88.5	4.1	52.6
Alyce clover	89.0	10.1	53.1
Blue stem grass	86.6	2.5	48.2
Oat hay	88.0	4.5	46.3
Mixed hay	89.7	5.2	50.5
Legume - hay	88.2	7.8	53.4
Alfalfa - clover	89.3	10.3	52.8
Alfalfa - sweet clover	91.2	11.2	50.5
Lespedeza - grass	89.7	5.2	50.5
White clover	88.0	10.5	55.6
Meadow hay	87.9	6.9	50.3
Native grasses	86.6	2.5	48.2
Bluegrass - legume	89.7	5.2	50.5
White sweet clover	90.0	10.5	52.75
Korean lespedeza	89.0	10.1	53.1
Carpet grass - lespedeza	90.5	6.6	51.5
Hay - pasture	89.4	4.7	53.3
Red clover	89.6	12.0	56.4
Grass - legume <u>1/</u> (fertile pasture)	90.0	17.5	72.0

1/ Suggested by Dr. D. D. Dodd and found to be conservative

<u>Crop</u>	<u>Dry Roughage (continued)</u>		
	<u>Total</u> <u>dry matter</u>	<u>Percent</u> <u>digestible protein</u>	<u>Total</u> <u>digestible nutrients</u>
Pasture grasses and clovers, mixed, from closely-grazed, fertile pasture, dried	90.0	13.1	64.7
Pasture grass, dried, western plains, clipped frequently	90.0	18.5	61.8
Pasture grass, dried, western plains, autumn	90.0	6.3	60.0
Pasture grasses, mixed, from poor to fair pasture, before heading out, dried	90.0	9.9	58.3
Pasture grass, dried, western mountain states, growing actively	90.0	8.6	59.3
Dodd Pasture grass	90.0	17.5	72.0
<u>Green Roughage</u>			
Sorghum, fodder sweet	24.9	0.8	17.3
Austrian peas	18.8	2.6	11.9
Vetch	18.2	3.5	12.3
Ladino	16.2	2.5	9.8
Bluegrass	31.8	2.4	18.6
Grass - clover	27.3	1.9	17.1
White clover	16.2	2.5	9.8
Ladino - Timothy	24.1	1.9	14.3
Corn silage	26.9	1.2	19.1
Orchard grass (before heading)	22.8	3.5	16.1
Orchard grass (all analyses)	29.1	1.7	16.0

Dodd's equivalent of .689 pounds of total digestible nutrients to produce one pound of milk and 5.5 pounds to produce one pound of beef was used in estimating the amount of milk and liveweight of beef equivalents.

The summarized data are given in the attached tables.

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